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Technology and Firm Performance in Mexico

Gladys López-Acevedo

The World Bank
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Abstract

López-Acevedo investigates the relationship between a firm's adoption of new manufacturing technology and its performance. A panel database that identifies technological adoption and tracks firms over time allows the use of different measures of firm performance—wages, productivity, net employment growth, job creation, and job destruction. Results show that technology is associated with high firm performance in all these metrics. The effect of new technology on performance is larger for firms located in the north and in Mexico City. This marginal value significantly increased after the 1994 crisis and the North American Free Trade Agreement. Furthermore, technology increased the wage of semi-skilled workers compared with unskilled workers by about 11 percent over seven years.

This paper—a product of the Latin America and the Caribbean Region, Poverty Reduction and Economic Management Sector Unit—is part of a larger effort in the region to reduce poverty and inequality through human capital investment. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Michael Geller, room I4-406, telephone 202-458-5155, fax 202-552-2112, email address mgeller@worldbank.org. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at gacevedo@worldbank.org. February 2002. (22 pages)

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Produced by the Research Advisory Staff

Mexico – Technology, Wages, and Employment

TECHNOLOGY AND FIRM PERFORMANCE IN MEXICO

Gladys López-Acevedo[1]

JEL Codes: L60, L20, J31, J38.

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1. Introduction

In the last two decades, broad-based reforms at both the sectoral and macroeconomic levels have fundamentally restructured the economic and institutional framework in Mexico. In the mid-1980s, Mexico began to shift from a state-interventionist system to a market-based economy. Reforms instituted a liberal trade regime, established capital-account convertibility, privatized public enterprises (including banks), and reduced government regulation of the financial, transportation, and utility sectors. At the macroeconomic level, fiscal discipline and structural reform brought about sharp decline in the fiscal deficit and inflation.

The government first launched a radical program of policy reforms in 1989 aimed at reducing government regulation and liberalizing trade. Trade liberalization, which began in mid-1985 and accelerated after Mexico joined the General Agreement on Tariffs and Trade in 1986, further intensified with the adoption of the North American Free Trade Agreement in 1994.

Though the external openness of the Mexican economy has quickly expanded, internal reforms have been slower to materialize. The World Bank (1998a) indicated that the productivity difference between export and non-trade sectors reflects the difference in speed between international and internal regulatory reform. It is telling in relation to this that manufacturing, the most important trade sector, improved rapidly in the early 1990s while the service sector deteriorated. But manufacturing only accounts for 25 percent of Mexican gross domestic product, while services account for over 40 percent, which may explain the slow response of the Mexican economy to vigorous trade policy reforms (World Bank 1998b).

During this last decade of rapid development, Mexican wages have polarized. The World Bank (2000) contends that skill-biased technical change caused by trade liberalization explains best the increase in earnings inequality that Mexico has experienced. In this paper, we estimate the effect of new technology adoption (TA) on wage inequality using a rich panel database of manufacturing firms that identifies TA and tracks firms over time. Furthermore, we compare the performance of firms that adopt new technology to those that do not using three separate firm performance measures: the wages earned by workers, the productivity of a firm (output per

worker), and the annual growth in the number of employed workers; while other studies have tended to use a single measure of performance.

Section 2 of this paper reviews relevant literature on firm performance and TA. Section 3 explains the data and our methodology. Section 4 discusses results for firm performance by time period, firm size, and firm location. Section 5 presents results of the TA determinants and wage performance joint estimation. Section 6 analyzes wage inequality. Section 7 offers conclusions.

2. Literature Review

A. Performance Measures

Studies measure firm performance in different ways, reflecting both the heterogeneity of the concept and the challenge of practically measuring it. In this paper we use five measures of firm performance—wages, productivity, net employment, job creation, and job destruction. These measures are proxies for a fairly amorphous concept. We want to understand how healthy a firm is, how likely it is to exist in the future, how much utility it creates for workers and consumers, and the contribution it makes to Mexico's development. Our measures by no means exhaustively cover these concepts, which collectively constitute firm performance, but a firm with high marks in these measures also has an exemplary performance.

Employment growth is a prevalent measure of firm performance (Geroski 1995). Positive changes in employment represent superior performance; negative changes in employment represent inferior performance. As Caves (1998) documents in his exhaustive compilation, employment growth has been used in many types of studies as a measure of firm performance (Baldwin and Rafiqusszaman 1995; Audretsch 1995; Davis, Haltiwanger, and Schuh 1996b; Baldwin 1995). Employment growth is particularly important for policy makers who focus on job creation. As noted by Davis, Haltiwanger, and Schuh (1996a) job creation and destruction are part of a larger process determining changes in the number and mix of jobs. In this process, new businesses enter the market, some expand, others contract, and many disappear. Additionally, capital, workers, and jobs are continually relocated between different activities.

The creation and destruction of jobs requires workers to decide between employment and unemployment. As a result of these processes, some workers must suffer long unemployment spells or severe declines in their earnings. Others may retire early or change residence to find work.

A second measure of firm performance is the wages that the firm pays to workers. A healthy firm may pay high efficiency wages, or it may simply maintain high quality of life for its workers by paying high wages. The wages paid by firms have been used as a measure of firm performance in numerous studies, including Aw and Batra (1999), Audretsch and others (2001), Bartel and Lichtenberg (1991), Berman, Bound, and Griliches (1994), Bernard and Jensen (1995), Brown and Medoff (1989), Dunne and Schmitz (1995), Doms, Dunne, and Troske (1997), and Oosterbeek and van Praag (1995).

Another firm performance used in this paper is firm productivity. This measure has also been used in numerous studies, including Baldwin and Rafiquzzaman (1995), Baldwin (1995), Bartel and Lichtenberg (1991), Aw and Batra (1999), Baily, Bartelsman, and Haltiwanger (1996), and Baily, Hulten, and Campbell (1992). Higher productivity represents superior performance; lower productivity represents inferior performance.

These measures of firm performance are non-identical; in cases they may be contradictory. For example, it is certainly feasible that a firm increases productivity by reducing employment (Baily, Bartelsman, and Haltiwanger 1996). In such an instance, productivity would indicate superior performance, while employment would suggest inferior performance. We try to interpret results in cases where the firm performance measures indicate similar performance patterns. When this similarity is absent from results, we either mention each metric separately or exclude the specific results from discussion.

B. Linking Technological Adoption to Firm Performance Measures

Some theoretical studies argue against stating unequivocal effects of TA on a developing country's labor force. Braverman (1974) contends that the introduction of advanced technology

results in a *reduction* of the average skill of workers. In this view, technology simply replaces skilled workers. Additionally, Rush and Ferraz (1993) find that technology improvements increase skills for some groups and leave others largely unaffected.

A variety of studies link TA to firm performance. One is Doms, Dunne, and Roberts (1995), who examine the impact of advanced manufacturing technology on U.S. manufacturing firms. They use data from the 1988 Survey of Manufacturing Technology to identify the adoption by establishments of 17 different advanced production technologies. These technologies include such innovations as CAD/CAM systems, robots, computers, and networks. They find evidence that firms adopting technology exhibit superior performance. Another is Audretsch and others (2001), who use wages, productivity and employment as performance measures for a panel of firms in The Netherlands. They find that investments in research and development (R&D) and skilled labor improve firm performance.

Aw and Batra (1999) provide evidence that technology (measured by R&D and worker training) has an impact on firm performance (measured by wages). This is consistent with the World Bank (1999), which also relates wages to technology (measured by R&D and technology acquisition).

Several studies have confirmed the relationship between TA and firm size (Mansfield 1962; Davies 1979; Romeo 1975; and Globerman 1975). This is probably one of the most robust results among surveys analyzing determinants of TA (López-Acevedo 2001). Others have found that firm size determines wages. As noted by Brown and Medoff (1989), other things being equal, large employers pay more than small employers. One way to explain this wage differential is through labor quality. Under this view, larger firms employ higher quality workers due to the greater capital intensity and capital-skill complementarity of larger establishments.

Revenga (1995) analyzes the impact of trade liberalization on employment and wages on Mexican manufacturing using panel data of firms for the 1984-1990 period.[2] She finds that tariff

[2] The data used was drawn from the plant-level Annual Manufacturing Survey.

reductions correlate with average wage increases. The correlation may reflect simply an increase in productivity caused by a relative increase in the portion of skilled labor. In a related vein, Tan (2000) investigates manufacturing sector data for Malaysia, and finds that information and communication technology increases total factor productivity by 4 to 6 percent annually.

Sargent and Matthews (1997) conclude that installing capital intensive, computer-controlled production machinery into a formerly manual Mexican plant does not impel a firm to train low skilled workers. If the adoption of advanced manufacturing technologies causes an increase in plant size, then it also increases the firm's skill development activity. However, they also find that productivity and skill development do not correlate with compensation.

3. Data and Methodology

The data used in this paper comes from a panel of manufacturing firms created with data from the National Survey of Employment, Salaries, Technology, and Training (ENESTYC) and the Annual Industry Survey (EIA). The panel includes observations for 1992, 1995, and 1999.[3]

Our goal is to understand, for particular types of firms, how is technology related to each firm's performance measure. For this estimation, we use a similar specification for the different performance measures:

$$\log(P_{it}) = \beta_0 + \beta_1 X_{it} + \beta_2 adopt_{it} + \varepsilon_{it} \qquad (1)$$

where:

$\log(P_{it})$	=	the logarithm of the performance measure;
X_{it}	=	a vector of firm characteristics;
$adopt_{it}$	=	a dummy variable indicating whether the firm adopted new technology;
ε_{it}	=	normal regression error;
i	=	refers to the firm being considered, and
t	=	the time period.

[3] For a description of these surveys and the panel see Appendix A and B in this volume.

For the productivity measure, we include a continuous variable for capital assets to control for correlation between capital and TA, since both influence productivity. Within each measure, for each time period, we restrict the sample only to firms of a particular size or location to estimate situation-specific effects. We do not present results by industry, nor for microenterprises, due to insufficient observations.

We measure wages in real pesos, productivity as units of output divided by the number of workers, and net employment as the difference between new hires and dismissals for a given year. Since we have detailed plant level information, we measure net job creation using firm-level employment changes, rather than worker-level changes.

4. Results

Several models were estimated. Only the results from the best models are discussed here. We estimated equation (1) using a fixed effects model specification.[4] As an experiment, we also estimated a random effects model specification, however, the results were broadly similar, though the fixed effects model tended to yield more robust estimates of the TA parameters of interest. Therefore, we only discuss the results of the fixed effects estimations for all the measures, organized by the sample universe (only small firms, only firms in the North, etc.), in Table 1.[5]

A. Overall

On balance, firms that adopt new technology exhibit superior performance in all the metrics than those firms that did not adopt technology. Controlling for firm size, age, the skill level of workers, and firms in the maquila sector, firms that adopted new technology in the 1992-99 sample are related with higher wages for workers of all skill levels. Controlling also for

[4] The fixed effects model implements the first differencing approach that generates parameter estimates measured in terms of changes over time and, at the same time, eliminates any potential biases from unmeasured firm-level factors that may be correlated with included variables.

[5] Tables A1.1-A1.38 show complete results of the fixed effects estimations for each firm performance measure.

capital assets, firms that adopted new technology in the same period are associated with a 26 percent higher productivity than firms that did not adopt technology.

Table 1. Relation between Technology Adoption and Firm Performance

Sample	Measure	1992-95		1995-99		Diff.	1992-99	
All	Wages: Total	0.5058	**	0.5594	**	0.0536	1.2417	**
	Highly skilled	0.2817	**	0.5265	**	0.2448	1.0614	**
	Semi-skilled	0.4981	**	0.5866	**	0.0885	1.2722	**
	Low skilled	0.2861	**	0.4271	**	0.1410	1.2529	**
	Productivity	0.0549	**	0.5360	**	0.4811	0.2577	**
	Net employment	0.3382	*	0.1130		-0.2252	0.0011	
	Job creation	0.1846	**	0.2189	**	0.0343	0.0985	
	Job destruction	0.1040	**	-0.0277		-0.1317	-0.0438	
Small size	Wages: Total	0.2284	**	0.2756	*	0.0472	1.9678	**
	Highly skilled	0.1329		0.2506		0.1177	2.1315	**
	Semi-skilled	0.2242	**	0.2432		0.0190	1.9052	**
	Low skilled	0.2393	**	0.3264	*	0.0871	2.2553	**
	Productivity	0.0773	**	0.3747		0.2974	-0.0229	
	Net employment	0.1736		-		-	-0.1965	
Medium size	Wages: Total	0.2711	**	0.4696	**	0.1985	1.6908	**
	Highly skilled	0.3023	**	0.4374	**	0.1351	1.5258	**
	Semi-skilled	0.2269	**	0.4664	**	0.2395	1.6805	**
	Low skilled	0.2145	*	0.3948	**	0.1803	1.7769	**
	Productivity	0.0839		0.3778	**	0.2939	0.2025	**
	Net employment	0.4949		-0.2620		-0.7569	-0.0021	
Large size	Wages: Total	0.3797	*	0.5302	**	0.1505	1.4971	**
	Highly skilled	0.5272		0.5526	**	0.0254	1.3165	**
	Semi-skilled	0.4442		0.4974	**	0.0532	1.5389	**
	Low skilled	0.0688		0.4242	**	0.3554	1.6095	**
	Productivity	-0.5443		0.4122	**	0.9565	0.2271	**
	Net employment	0.0238		0.2741		0.2503	-0.4370	
North	Total wages	0.2580	**	0.5831	**	0.3251	0.6985	
	Productivity	-0.0368		0.7089	**	0.7457	0.4051	**
	Net employment	0.5536		0.0501		-0.5035	-0.0097	
Center	Total wages	1.1191	**	0.5582	**	-0.5609	1.3955	**
	Productivity	0.0947	**	0.4634	**	0.3687	0.2552	**
	Net employment	-0.0467		0.3821		0.4288	0.1822	
South	Total wages	2.1293	**	0.4658	**	-1.6635	1.5689	
	Productivity	0.0017		0.4959		0.4942	0.1573	
	Net employment	-1.6972		-0.2310		1.4662	-1.2882	
Mexico City	Total wages	0.3618	**	0.6487	**	0.2869	1.5586	**
	Productivity	0.0375		0.4866	**	0.4491	0.0923	
	Net employment	0.5631	*	-0.2403		-0.8034	0.1190	

* Significant at 10% level; ** Significant at 5% level.

Note: Figures show regression coefficients for the TA indicator variable, which in these models can be interpreted as elasticities.

In the later period of 1995-99, firms adopting new technology are associated with 56 percent higher wages, and 54 percent higher productivity than firms that did not adopt technology. In the earlier period of 1992-95, firms that adopted new technology are related with 51 percent higher wages, 5 percent higher productivity, and employment of 34 percent more workers than firms that did not adopt technology.

B. Time Period: 1992-95 versus 1995-99

For all the firm performance measures we find a marked change in the influence of technology between 1992-95 and 1995-99. Technology relation with wage and productivity performance is significantly larger in the latter period than in the earlier period. The only exceptions are for wage performance in firms located in the Center and South regions.

Firms adopting technology are associated with 51 percent higher wages in the early period, and 56 percent higher wages in the later period, than firms that did not adopt technology. Although the net employment measurement for all firms appears to contradict this trend, net employment is not significant in the later period.

The relation of technology with job creation, measured as the number of new hires in a given year, is higher for the 1995-99 period than for the 1992-95 period. Moreover, technology is positively associated with job destruction, measured as the numbers of dismissals in a given year, in the 1992-95 period, while there is no significant relation in the 1995-99 period.

In only two statistically significant cases the relation of technology with firms' performance was higher in the early period than the latter. In the Center and South of Mexico, technology was less effective in 1995-99 than in 1992-95. In the North, the change in the wage performance between time periods was 32 percent; in the Capital, the change was 29 percent; in the Center, the change was –56 percent, and in the South it was –166 percent. We should note that in both periods technology still is associated with higher wages, but in the Center and South technology is related to wages by a smaller percentage in the later period than in the earlier period. Much of Mexico's trade-dependent industry is in the North near the U.S. border and in

the Capital. It may be that these industries were more affected by liberalization and the 1994 crisis, and so the increased competition they experienced added to the value of technology for them.

C. Firm Size

Technology is associated with higher wages in all firm sizes, but for the 1992-95 and 1995-99 periods, the relation between technology and wage performance positively correlates with firm size. However, for the overall period (1992-99), the relation of technology with wage performance is larger for smaller firms.

Closer analysis of firm size paints a different picture. We ran several regressions where the dependent variable, rather than total wages, was the wages of a particular skill group. These regressions clarify the relation of technology with different types of workers. We proceeded to conduct separate analyses for small firms only, for medium firms only, and for large firms only. These analyses suggest a robust conclusion for the 1992-99 period. For a worker of any single skill group, technology *negatively* correlates with firm size. For highly skilled workers, small technology firms are associated to a wage increase of 213 percent, medium technology firms of 153 percent, and large technology firms of 132 percent. For low skilled workers, small technology firms are related to a wage increase of 226 percent, medium technology firms are related to a wage increase of 178 percent, and large technology firms are related to a wage increase of 161 percent. Wages for semi-skilled workers experience similar differences. It appears that for large firms relative to small ones, technology increases employment to some extent but decreases wages. In absolute terms, technology increases wages and employment in both small and large firms, but its relative effect differs between firm sizes.

The relation of technology with the performance of a firm's productivity also positively correlates with firm size. For medium-size firms, technology is associated with a 20 percent effect on productivity, while for large firms it is 23 percent.

D. Firm Location

No regional relationship exists in the first time period, but in the later period, firms located in the Capital or close to the U.S. border, present the largest effect of technology on performance. In the 1995-99 period, technology firms in the North are associated to a 58 percent wage increase over their non-technology peers; firms in the Capital are associated to a 65 percent benefit, firms in the Center are associated to a 56 percent benefit, and firms in the South are associated to a 47 percent benefit. For productivity, Northern technology firms are related to a 71 percent benefit, Capital technology firms are related to a 49 percent benefit, and Central technology firms are related to a 46 percent benefit. However, in the earlier period, this trend was reversed: Northern technology firms were associated with a 26 percent wage benefit, Capital technology firms were associated with a 36 percent benefit, Central firms were associated with a 112 percent benefit, and Southern firms were associated with a 213 percent benefit.

For the complete 1992-99 period, the highest relation between productivity and technology is for the Northern firms (40 percent), and the highest relation between technology and wages is for the Capital firms (156 percent).

5. A Joint Estimation for Wage Performance and Technology Adoption

In addition to the association between TA and firm performance we took into account the causality between TA and firm performance. Therefore, we conducted a joint estimation for the TA and worker wages equations using a three-stage least squares method. Since this paper investigates the relation of technology with firm performance rather than the determinants of TA, we only show results for the regression with worker wages as dependent variable (Table 2).

These results present expected findings. Technology is related to wages by quite large amounts in all three-time periods. However, surprisingly, we find that this relation is larger for the 1992-95 period than for the 1995-99 period. Larger firms paid higher wages than smaller firms in the later period, though in the first period (1992-95) smaller firms appeared to pay higher wages than large firms.

Table 2. Joint Estimation for Wage Performance and Technology Adoption

Dependent Variable: Log(Total Wages)	1992-95 Coeff.		1992-95 Z-St.	1995-99 Coeff.		1995-99 Z-St.	1992-99 Coeff.		1992-99 Z-St.
Firm size: Small	-0.7557	**	-9.840	-0.6829		-1.528	-2.3483	**	-3.540
Medium	-1.3218	**	-9.249	0.0216		0.048	-1.9225	**	-2.733
Large	-2.7490	**	-11.724	0.9890	**	2.113	-0.9771		-1.345
Age	0.0119	**	6.878	0.0063	**	5.830	0.0075	**	5.474
Share of labor: Semi-skilled	0.0123	**	3.911	0.0152	**	3.319	0.0266	**	3.445
Low skilled	0.0077	**	2.516	0.0091	**	2.012	0.0226	**	2.923
Maquila	0.0055		0.094	0.0381		0.727	-0.0192		-0.319
Technology adoption	4.2530	**	9.416	2.3211	**	6.723	2.6770	**	4.523
Year: 1995	-5.6625	**	-51.945				-5.9910	**	-48.656
1999				0.2261	**	2.462	-5.8385	**	-94.480
Constant	8.5051	**	18.443	3.1167	**	6.019	9.5515	**	9.918
Number of obs.	6,425			3,388			3,141		
R-sq (Technology adoption)	0.1455			0.1028			0.0770		
R-sq (Wage Performance)	0.7244			0.0771			0.8449		

* Significant at 10% level; **Significant at 5% level.

6. Wage Inequality

To estimate the effect of TA on wage inequality, we estimate fixed effects models where the dependent variable is the logarithm of the wages of skilled workers divided by the wages of unskilled workers. We run two regressions: one for the logarithm of the ratio of highly skilled workers' wages to unskilled workers' wages, and another for the logarithm of the ratio of semi-skilled workers' wages to unskilled workers' wages. Table 3 shows that, controlling for relevant firm characteristics; technology has exacerbated the wage gap between semi-skilled and unskilled workers by about eleven percent in the seven years of our sample. Additionally, the higher the overall skill level of a firm, the larger the wage gap between skilled and unskilled workers. We also find that smaller firms have worse wage inequality than larger firms in the 1992-95 period.

Results for wage inequality between highly skilled and unskilled workers appear in Table A2.1. TA worsens wage inequality between highly skilled and unskilled workers in all three periods, but results are statistically insignificant. However, as in the first case, the higher the overall skill level of a firm, the larger the wage gap between highly skilled and unskilled workers.

Table 3. Wage Inequality

Dependent variable: Log(semi-skilled/unskilled wages)	1992-95 Coeff.	Z-St.	1995-99 Coeff.	Z-St.	1992-99 Coeff.	Z-St.
Firm Characteristics						
Size: Small	3.3306 *	1.786	-0.8229	-1.069	-0.8450	-0.769
Medium	1.8374	1.137	-0.9877	-1.277	-0.8427	-0.762
Large	-1.9115 **	-1.987	-0.9186	-1.186	-0.7914	-0.714
Age	-0.0485 **	-5.125	0.0066 **	2.516	-0.0061 **	-2.306
Employees: Highly skilled	0.0045 **	2.197	0.0007	0.336	0.0049 **	2.113
Semi-skilled	0.0015 **	13.610	0.0025 **	15.259	0.0022 **	14.74
Unskilled	-0.0016 **	-15.263	-0.0025 **	-15.607	-0.0025 **	-17.512
Maquila	-0.1802	-1.428	0.0084	0.093	0.0776	0.872
Technology adoption	0.0059	0.136	0.1270 **	2.064	0.1136 **	2.145
Constant	0.5366	0.535	1.3566 *	1.748	1.7584	1.585
Number of obs.	5,733		3,075		2,910	
R-sq: Within	0.1518		0.2985		0.2962	
Between	0.0117		0.3432		0.3792	
Overall	0.0127		0.3297		0.3436	

* Significant at 10% level; **Significant at 5% level.

7. Conclusions

Using a panel of firms with observations in 1992, 1995, and 1999, this paper has sought to understand how new technology correlates with the performance of Mexican manufacturing firms, measured by wages, productivity, net employment, job creation, and job destruction. We use fixed effects models to estimate firm performance and determine wage inequality. Results suggest that controlling for relevant variables, technology is positively related to firm performance. Trade liberalization and the 1994 crisis magnified this relation. The effect of new technology on firm performance also correlates positively and strongly with firm size, and proximity to the U.S. border or location in Mexico City. Results present expected findings, that is, technology is correlated with higher wages in all time periods.

In an analysis of the behavior of wages, TA improves the wages of both low-skill workers and high skill workers, although it improves the latter more.

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ANNEX 1: Firm Performance Fixed Effects Estimations

Table A1.1. Wage Performance of Manufacturing Firms

Dependent variable: log(total wages)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Size: Small	-11.6052	**	-5.456	0.2905		0.672	1.9815		0.814
Medium	-24.5036	**	-12.423	0.7041		1.631	2.3509		0.960
Large	-50.4489	**	-31.028	1.1036	**	2.559	2.3329		0.953
Age	-2.0664	**	-143.300	0.0105	**	6.150	-0.1000	**	-11.300
Employees: Highly skilled	0.0029		0.891	0.0054	**	3.957	-0.0161	**	-2.005
Semi-skilled	0.0008	**	5.068	0.0016	**	17.057	0.0015	**	3.870
Low skilled	0.0008	**	5.306	0.0011	**	11.233	0.0031	**	6.677
Maquila	-0.0773		-0.396	-0.0188		-0.315	-0.2846		-0.914
Technology adoption	0.5058	**	7.472	0.5594	**	13.983	1.2417	**	6.554
Constant	75.0886	**	59.810	4.6725	**	10.834	8.0708	**	3.294
Number of obs.	6,425			3,403			3,184		
R-sq: within	0.8865			0.3514			0.0959		
between	0.0131			0.6732			0.0441		
overall	0.0162			0.5944			0.0369		

* Significant at 10% level; ** Significant at 5% level.

Table A1.2. Wage Performance of Highly Skilled Workers in Manufacturing Firms

Dependent variable: log(wages for highly skilled workers)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Size: Small	-10.4433	**	-8.442	-1.4432	**	-2.349	0.6486		0.218
Medium	dropped			-1.0629	*	-1.727	0.8157		0.274
Large	-37.1335	**	-24.185	-0.8533		-1.386	0.5432		0.183
Age	-2.0898	**	-133.917	0.0100	**	3.937	-0.1030	**	-10.616
Employees: Highly skilled	0.0367	**	9.147	0.0212	**	10.556	0.0026		0.285
Semi-skilled	0.0007	**	2.902	0.0015	**	8.833	0.0007	*	1.677
Low skilled	0.0006	**	2.908	0.0010	**	5.858	0.0026	**	5.033
Maquila	0.1374		0.656	-0.0482		-0.536	-0.3140		-0.905
Technology adoption	0.2817	**	3.870	0.5265	**	8.732	1.0614	**	4.951
Constant	68.7051	**	100.679	4.3511	**	7.084	8.0569	**	2.709
Number of obs.	5,091			2,860			2,787		
R-sq: within	0.9093			0.2645			0.0890		
between	0.0007			0.3563			0.0095		
overall	0.0015			0.3450			0.0200		

* Significant at 10% level; ** Significant at 5% level.

Table A1.3. Wage Performance of Semi-Skilled Workers in Manufacturing Firms

Dependent variable: log(wages for semi-skilled workers)	1992-1995		1995-1999		1992-1999	
	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.
Firm Characteristics						
Size: Small	-15.7456 **	-7.043	0.8519	1.300	2.6544	0.876
Medium	-30.3552 **	-14.189	1.1929 *	1.813	3.0990	1.011
Large	-51.0929 **	-30.787	1.6078 **	2.440	3.1096	1.014
Age	-2.0843 **	-138.594	0.0128 **	6.341	-0.1010 **	-11.240
Employees: Highly skilled	0.0007	0.219	0.0024	1.495	-0.0190 **	-2.324
Semi-skilled	0.0012 **	7.515	0.0021 **	19.023	0.0018 **	4.647
Low skilled	0.0004 **	2.388	0.0005 **	3.836	0.0025 **	5.308
Maquila	-0.0358	-0.178	-0.0429	-0.605	-0.2572	-0.814
Technology adoption	0.4981 **	7.065	0.5866 **	12.357	1.2722 **	6.617
Constant	77.0467 **	58.036	3.4413 **	5.219	6.7411 **	2.192
Number of obs.	6,230		3,380		3,177	
R-sq: within	0.8845		0.3251		0.0919	
between	0.0086		0.5735		0.0266	
overall	0.0125		0.5150		0.0325	

* Significant at 10% level; ** Significant at 5% level.

Table A1.4. Wage Performance of Low Skilled Workers in Manufacturing Firms

Dependent variable: log(wages for low skilled workers)	1992-1995		1995-1999		1992-1999	
	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.
Firm Characteristics						
Size: Small	-2.6941	-0.980	-0.0745	-0.121	1.8284	0.603
Medium	1.4820	0.622	0.4479	0.728	2.1268	0.700
Large	-51.8257 **	-36.558	0.7639	1.241	2.1840	0.719
Age	-2.1426 **	-155.520	0.0060 **	2.539	-0.1122 **	-10.903
Employees: Highly skilled	-0.0033	-1.089	0.0021	1.143	-0.0268 **	-2.954
Semi-skilled	-0.0003 *	-1.831	0.0001	0.375	0.0011 **	1.957
Low skilled	0.0019 **	12.157	0.0028 **	19.271	0.0046 **	8.182
Maquila	0.1674	0.900	-0.0392	-0.474	-0.3695	-1.069
Technology adoption	0.2861 **	4.547	0.4271 **	7.595	1.2529 **	6.088
Constant	67.9290 **	46.358	3.7585 **	6.109	7.0532 **	2.323
Number of obs.	5,896		3,095		2,916	
R-sq: within	0.9131		0.2863		0.1108	
between	0.0015		0.5918		0.0972	
overall	0.0066		0.5154		0.0565	

* Significant at 10% level; ** Significant at 5% level.

Table A1.5. Productivity Performance of Manufacturing Firms

Dependent variable: Log(productivity)		1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics										
Size:	Small	dropped			3.0028	**	2.525	3.3980	**	3.509
	Medium	-3.7131	**	-5.359	2.6162	**	2.216	3.1127	**	3.234
	Large	dropped			2.6404	**	2.243	3.0252	**	3.150
Age		0.1150	**	19.084	0.0130	**	4.012	0.0183	**	8.095
Employees:	Highly skilled	0.0006		0.508	0.0021		0.693	0.0059	**	3.117
	Semi-skilled	-0.0003	**	-5.388	-0.0001		-0.317	0.0001		0.831
	Low skilled	-0.0004	**	-5.818	0.0001		0.366	-0.0003	**	-2.753
Maquila		0.0600		0.823	-0.2120	*	-1.731	-0.0323		-0.398
Technology adoption		0.0549	**	2.051	0.5360	**	7.022	0.2577	**	5.355
Capital assets		0.0000		-0.595	1.4e-06	**	2.872	1.9e-06	**	7.450
Constant		1.0192	**	5.208	1.0563		0.902	0.4836		0.505
Number of obs.		3,894			2,101			2,714		
R-sq:	within	0.2182			0.1261			0.1083		
	between	0.0142			0.0953			0.1126		
	overall	0.0146			0.1079			0.1050		

* Significant at 10% level; ** Significant at 5% level.

Table A1.6. Net Employment Performance of Manufacturing Firms

Dependent variable: log(net employment)		1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics										
Size:	Small	dropped			0.8657		0.750	-0.0065		-0.017
	Medium	dropped			1.5397		1.325	-0.1841		-0.915
	Large	dropped			1.5874		1.361	dropped		
Age		0.0139		0.353	-0.0053		-0.567	-0.0025		-0.337
Employees:	Highly skilled	-0.0078		-1.369	0.0172	**	2.014	0.0104	**	2.088
	Semi-skilled	0.0013	*	1.909	0.0013	**	2.580	0.0004		1.324
	Low skilled	0.0017	**	4.915	0.0006		1.028	0.0006	*	1.745
Maquila		-1.2054	**	-2.132	0.2843		1.085	0.0446		0.201
Technology adoption		0.3382	*	1.838	0.1130		0.617	0.0011		0.007
Constant		1.6938		1.611	0.5863		0.494	2.3674	**	7.164
Number of obs.		1,680			1,323			1,158		
R-sq:	within	0.1260			0.1016			0.0374		
	between	0.0742			0.1132			0.1313		
	overall	0.0726			0.1177			0.1117		

* Significant at 10% level; ** Significant at 5% level.

Table A1.7. Job Creation of Manufacturing Firms

Dependent variable: log(new hires)		1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics										
Size:	Small	dropped			0.9377		0.885	dropped		
	Medium	-0.2618		-0.253	1.3384		1.261	0.3246	*	2.456
	Large	dropped			1.5009		1.414	0.4757	**	0.187
Age		-0.0360	**	-2.639	-0.0027		-0.772	0.0006		1.191
Employees:	Highly skilled	0.0004		0.161	0.0023		0.912	0.0038		8.484
	Semi-skilled	0.0015	**	8.745	0.0013	**	6.446	0.0013	**	7.416
	Low skilled	0.0014	**	9.386	0.0009	**	4.890	0.0013	**	0.486
Maquila		-0.0110		-0.056	-0.1353		-1.153	0.0559		1.334
Technology adoption		0.1846	**	2.820	0.2189	**	2.732	0.0985		11.942
Constant		3.5437	**	8.555	1.4705		1.382	2.3608	**	1.884
Number of obs.		4,262			2,714			2,494		
R-sq:	within	0.0961			0.0804			0.0814		
	between	0.1819			0.1506			0.1388		
	overall	0.1657			0.1426			0.1133		

* Significant at 10% level; ** Significant at 5% level.

Table A1.8. Job Destruction of Manufacturing Firms

Dependent variable: log(laidoffs)		1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics										
Size:	Small	0.4891		0.499	0.5472		0.542	-1.0652	**	-6.302
	Medium				1.3311		1.317	-0.3599	**	-3.933
	Large	-2.7041		-1.587	1.5890		1.571	dropped		
Age		-0.0046		-0.408	-0.0021		-0.741	-0.0074	**	-2.552
Employees:	Highly skilled	0.0007		0.283	0.0010		0.434	0.0016		0.551
	Semi-skilled	0.0005	**	3.092	0.0006	**	3.349	0.0008	**	5.329
	Low skilled	0.0007	**	5.573	0.0006	**	3.459	0.0007	**	4.411
Maquila		-0.1039		-0.682	-0.1767	*	-1.716	-0.0286		-0.275
Technology adoption		0.1040	**	2.007	-0.0277		-0.396	-0.0438		-0.702
Constant		3.0692	**	5.866	1.8903	*	1.867	3.6234	**	27.782
Number of obs.		5,076			2,885			2,723		
R-sq:	within	0.0236			0.0594			0.0576		
	between	0.2641			0.1831			0.2337		
	overall	0.2013			0.1658			0.1710		

* Significant at 10% level; ** Significant at 5% level.

Table A1.9. Wage Performance of Small Manufacturing Firms

Dependent variable: log(total wages)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2342	**	-130.885	0.0115		1.345	-0.6836	**	-7.114
Employees: Highly skilled	0.0144	*	1.841	0.0509		1.305	-0.2212		-1.215
Semi-skilled	0.0035	**	5.862	0.0230	**	5.595	-0.0034		-0.351
Low skilled	0.0019	**	4.538	0.0140	**	3.107	-0.0033		-0.394
Maquila	0.0946		0.497	0.0003		0.001	0.5370		0.308
Technology adoption	0.2284	**	2.970	0.2756	*	1.808	1.9678	**	2.909
Constant	66.7124	**	140.760	3.2216	**	9.437	24.5766	**	9.567
Number of obs.	2,187			311			206		
R-sq: within	0.9526			0.4274			0.4523		
between	0.0056			0.3573			0.0414		
overall	0.0061			0.3508			0.0346		

* Significant at 10% level; ** Significant at 5% level.

Table A1.10. Wage Performance of Highly Skilled Workers in Small Manufacturing Firms

Dependent variable: log(wages for highly skilled workers)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.1817	**	-102.417	0.0158		1.172	-0.6266	**	-5.681
Employees: Highly skilled	0.0551	**	6.100	0.2484	**	3.904	-0.0201		-0.085
Semi-skilled	0.0015	*	1.954	0.0142	*	1.984	-0.0073		-0.686
Low skilled	0.0006		1.134	0.0060		0.835	-0.0082		-0.883
Maquila	0.2111		0.866	-0.4179		-1.204	0.5077		0.275
Technology adoption	0.1329		1.381	0.2506		0.876	2.1315	**	2.606
Constant	64.5873	**	107.615	1.4061	**	2.572	21.5287	**	7.044
Number of obs.	1,838			254			172		
R-sq: within	0.9423			0.3667			0.4151		
between	0.0004			0.3362			0.0326		
overall	0.0032			0.3179			0.0268		

* Significant at 10% level; ** Significant at 5% level.

Table A1.11. Wage Performance of Semi-Skilled Workers in Small Manufacturing Firms

Dependent variable: log(wages for semi-skilled workers)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2457	**	-127.415	0.0151		1.551	-0.6718	**	-6.664
Employees: Highly skilled	-0.0084		-1.036	-0.0133		-0.296	-0.2687		-1.381
Semi-skilled	0.0076	**	12.233	0.0361	**	7.740	0.0036		0.364
Low skilled	-0.0003		-0.628	0.0069		1.337	-0.0094		-1.098
Maquila	0.0902		0.460	0.1015		0.381	0.5639		0.313
Technology adoption	0.2242	**	2.830	0.2432		1.406	1.9052	**	2.726
Constant	66.3022	**	135.379	2.2876	**	5.882	23.6665	**	8.832
Number of obs.	2,181			305			205		
R-sq: within	0.9515			0.5331			0.4427		
between	0.0135			0.4256			0.0427		
overall	0.0038			0.4240			0.0345		

* Significant at 10% level; ** Significant at 5% level.

Table A1.12. Wage Performance of Low Skilled Workers in Small Manufacturing Firms

Dependent variable: log(wages for low skilled workers)	1992-1995		1995-1999		1992-1999	
	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.
Firm Characteristics						
Age	-2.2078 **	-108.324	0.0107	1.156	-1.1020 **	-10.732
Employees: Highly skilled	0.0284 **	2.977	0.0556	1.083	-0.3039	-1.633
Semi-skilled	-0.0032 **	-4.211	-0.0041	-0.804	-0.0051	-0.517
Low skilled	0.0053 **	10.661	0.0303 **	6.279	0.0112	1.094
Maquila	0.1784	0.764	-0.0177	-0.077	1.3936	0.908
Technology adoption	0.2393 **	2.630	0.3264 *	1.846	2.2553 **	3.838
Constant	64.9057 **	114.613	2.1844 **	5.847	33.0652 **	12.470
Number of obs.	2,053		275		186	
R-sq: within	0.9374		0.5372		0.6569	
between	0.0085		0.2551		0.0964	
overall	0.0134		0.2747		0.0647	

* Significant at 10% level; ** Significant at 5% level.

Table A1.13. Productivity Performance of Small Manufacturing Firms

Dependent variable: log(productivity)	1992-1995		1995-1999		1992-1999	
	Coeff.	t-Stat.	Coeff.	t-Stat.	Coeff.	t-Stat.
Firm Characteristics						
Age	0.0966 **	11.531	-0.0012	-0.029	0.0907 **	3.441
Employees: Highly skilled	0.0066 *	1.954	-0.6451 *	-2.241	0.0271	0.797
Semi-skilled	-0.0014 **	-5.169	0.0134	0.877	-0.0066 **	-2.751
Low skilled	-0.0011 **	-4.089	0.0287	1.752	-0.0015	-0.578
Maquila	-0.0112	-0.136	-0.7320	-1.038	0.4251	1.048
Technology adoption	0.0773 **	2.226	0.3747	0.900	-0.0229	-0.155
Capital assets	0.0000	-0.829	0.0000	-0.006	0.0000	-1.047
Constant	1.2966 **	5.281	4.2832	1.200	2.3305 **	3.250
Number of obs.	1,605		150		132	
R-sq: within	0.2302		0.6767		0.4344	
between	0.0058		0.0956		0.0018	
overall	0.0069		0.0753		0.0029	

* Significant at 10% level; ** Significant at 5% level.

Table A1.14. Net Employment Performance of Small Manufacturing Firms

Dependent variable: log(net employment)	1992-1995		1992-1999	
	Coeff.	t-Stat.	Coeff.	t-Stat.
Firm Characteristics				
Age	-0.1090 *	-1.922	-0.0243	-0.160
Employees: Highly skilled	0.0424	1.308	-0.0788	-0.198
Semi-skilled	0.0016	0.951	0.0179	1.152
Low skilled	0.0031 **	5.065	0.0158	1.437
Maquila	0.3343	0.523	dropped	
Technology adoption	0.1736	0.675	-0.1965	-0.264
Constant	4.0638 **	2.889	1.1206	0.323
Number of obs.	585		64	
R-sq: within	0.3118		0.3302	
between	0.0580		0.3032	
overall	0.0729		0.3490	

Note: Estimation for 1995-1999 was not possible due to insufficient observations.
* Significant at 10% level; ** Significant at 5% level.

Table A1.15. Wage Performance of Medium-size Manufacturing Firms

Dependent variable: log(total wages)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2438	**	-99.936	0.0152	**	5.117	-0.2996	**	-12.433
Employees: Highly skilled	0.0734	**	2.698	0.0177	**	2.749	-0.1136	**	-3.200
Semi-skilled	0.0088	**	4.733	0.0075	**	14.137	0.0072	**	2.756
Low skilled	0.0072	**	4.647	0.0065	**	10.995	0.0014		0.514
Maquila	0.0037		0.014	-0.0414		-0.450	-0.1122		-0.196
Technology adoption	0.2711	**	2.981	0.4696	**	8.295	1.6908	**	5.547
Constant	56.1743	**	107.432	4.2907	**	40.263	15.4095	**	19.297
Number of obs.	1,139			1,524			1,298		
R-sq: within	0.9587			0.4770			0.2217		
between	0.0024			0.3347			0.0001		
overall	0.0068			0.3487			0.0177		

* Significant at 10% level; ** Significant at 5% level.

Table A1.16. Wage Performance of Highly Skilled Workers in Medium-sized Manufacturing Firms

Dependent variable: log(wages for highly skilled workers)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2079	**	-74.638	0.0153	**	3.291	-0.2841	**	-10.799
Employees: Highly skilled	0.2540	**	7.447	0.0866	**	8.225	-0.0854	**	-2.144
Semi-skilled	-0.0003		-0.111	0.0045	**	5.417	0.0048	*	1.653
Low skilled	0.0048	**	2.187	0.0053	**	5.590	-0.0010		-0.318
Maquila	0.2786		0.775	-0.1394		-0.967	-0.2488		-0.388
Technology adoption	0.3023	**	2.555	0.4374	**	4.941	1.5258	**	4.448
Constant	55.0889	**	77.814	2.3202	**	13.633	13.5562	**	15.601
Number of obs.	894			1,285			1,133		
R-sq: within	0.9502			0.3287			0.2003		
between	0.0145			0.2144			0.0010		
overall	0.0139			0.2318			0.0116		

* Significant at 10% level; ** Significant at 5% level.

Table A1.17. Wage Performance of Semi-Skilled Workers in Medium-sized Manufacturing Firms

Dependent variable: log(wages for semi-skilled workers)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2533	**	-91.120	0.0165	**	4.701	-0.3018	**	-12.375
Employees: Highly skilled	0.0236		0.791	-0.0040		-0.534	-0.1374	**	-3.825
Semi-skilled	0.0187	**	8.892	0.0114	**	18.195	0.0108	**	4.054
Low skilled	-0.0007		-0.404	0.0029	**	4.114	-0.0023		-0.811
Maquila	0.0164		0.058	-0.1558		-1.438	-0.1340		-0.231
Technology adoption	0.2269	**	2.263	0.4664	**	6.954	1.6805	**	5.448
Constant	55.6548	**	96.611	3.5941	**	28.372	14.8949	**	18.426
Number of obs.	1,131			1,516			1,297		
R-sq: within	0.9522			0.4960			0.2354		
between	0.0021			0.4313			0.0004		
overall	0.0063			0.4443			0.0212		

* Significant at 10% level; ** Significant at 5% level.

Table A1.18. Wage Performance of Low Skilled Workers in Medium-size Manufacturing Firms

Dependent variable: log(wages for low skilled workers)	1992-1995 Coeff.	t-Stat.	1995-1999 Coeff.	t-Stat.	1992-1999 Coeff.	t-Stat.
Firm Characteristics						
Age	-2.1985 **	-78.789	0.0057	1.562	-0.3750 **	-13.232
Employees: Highly skilled	0.0207	0.627	0.0101	1.152	-0.1133 **	-2.627
Semi-skilled	0.0020	0.734	0.0008	1.228	0.0058 **	2.035
Low skilled	0.0238 **	10.281	0.0144 **	19.679	0.0086 **	2.893
Maquila	0.1101	0.344	0.0070	0.063	-0.0661	-0.109
Technology adoption	0.2145 *	1.920	0.3948 **	5.739	1.7769 **	5.623
Constant	54.0983 **	82.181	3.0757 **	23.254	15.4893 **	17.432
Number of obs.	1,042		1,404		1,196	
R-sq: within	0.9443		0.5012		0.2632	
between	0.0008		0.4903		0.0034	
overall	0.0091		0.4860		0.0210	

* Significant at 10% level; ** Significant at 5% level.

Table A1.19. Productivity Performance of Medium-size Manufacturing Firms

Dependent variable: log(productivity)	1992-1995 Coeff.	t-Stat.	1995-1999 Coeff.	t-Stat.	1992-1999 Coeff.	t-Stat.
Firm Characteristics						
Age	0.0725 **	3.330	0.0200 **	3.508	0.0385 **	8.168
Employees: Highly skilled	-0.0184	-0.834	-0.0005	-0.042	0.0127 *	1.749
Semi-skilled	-0.0035 **	-2.448	0.0018 *	1.895	-0.0002	-0.426
Low skilled	-0.0029 **	-2.486	0.0029 **	2.301	-0.0003	-0.447
Maquila	0.1047	0.389	-0.2818	-1.527	-0.1210	-1.000
Technology adoption	0.0839	0.998	0.3778 **	3.604	0.2025 **	3.202
Capital assets	-2.1e-05 **	-2.111	0.0001 **	6.928	0.0001 **	12.179
Constant	2.3731 **	4.468	2.7011 **	12.591	2.5359 **	15.750
Number of obs.	439		919		1,083	
R-sq: within	0.1749		0.3774		0.3331	
Between	0.0163		0.0239		0.1895	
Overall	0.0047		0.0359		0.1659	

* Significant at 10% level; ** Significant at 5% level.

Table A1.20. Net Employment Performance of Medium-size Manufacturing Firms

Dependent variable: log(net employment)	1992-1995 Coeff.	t-Stat.	1995-1999 Coeff.	t-Stat.	1992-1999 Coeff.	t-Stat.
Firm Characteristics						
Age	-0.0849	-0.761	-0.0193	-0.594	0.0075	0.404
Employees: Highly skilled	0.5085 **	2.694	-0.0041	-0.066	0.0114	0.349
Semi-skilled	0.0073	0.510	0.0077 **	2.272	0.0023	1.027
Low skilled	0.0099	1.296	0.0078 **	2.116	0.0031 *	1.775
Maquila	-1.3010	-0.852	0.2369	0.493	0.5642 *	1.670
Technology adoption	0.4949	1.136	-0.2620	-0.800	-0.0021	-0.008
Constant	1.7751	0.666	1.4846 *	1.728	1.1655 *	1.905
Number of obs.	267		573		449	
R-sq: within	0.3957		0.1136		0.0708	
between	0.0477		0.1014		0.0655	
overall	0.0713		0.1029		0.0775	

* Significant at 10% level; ** Significant at 5% level.

Table A1.21. Wage Performance of Large Manufacturing Firms

Dependent variable: log(total wages)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-2.2355	**	-44.339	0.0079	**	3.314	-0.0742	**	-6.113
Employees: Highly skilled	0.1464		1.154	0.0037	*	1.770	-0.0112		-1.244
Semi-skilled	0.0077		0.616	0.0012	**	12.535	0.0017	**	3.995
Low skilled	0.0298	**	2.158	0.0009	**	8.512	0.0035	**	6.869
Maquila	-0.3268		-0.438	0.0089		0.092	-0.0182		-0.036
Technology adoption	0.3797	*	1.808	0.5302	**	7.590	1.4971	**	4.837
Constant	41.6300	**	48.372	6.1945	**	59.762	9.4357	**	16.680
Number of obs.	581			1,560			1,560		
R-sq: within	0.9024			0.3194			0.3194		
between	0.0023			0.5163			0.5163		
overall	0.0037			0.4812			0.4812		

* Significant at 10% level; ** Significant at 5% level.

Table A1.22. Wage Performance of Highly Skilled Workers in Large Manufacturing Firms

Dependent variable: log(wages for highly skilled workers)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-2.2503	**	-24.594	0.0070	**	1.968	-0.0775	**	-5.947
Employees: Highly skilled	0.3149		1.560	0.0310	**	8.194	0.0090		0.903
Semi-skilled	0.0011		0.078	0.0012	**	6.963	0.0010	**	2.073
Low skilled	0.0125		0.742	0.0008	**	4.537	0.0031	**	5.582
Maquila	-0.6012		-0.457	-0.1295		-0.855	0.0385		0.069
Technology adoption	0.5272		1.507	0.5526	**	5.137	1.3165	**	3.826
Constant	43.4315	**	27.187	3.6018	**	23.058	7.6658	**	12.304
Number of obs.	261			1,316			1,480		
R-sq: within	0.9299			0.3222			0.1016		
between	0.0008			0.2641			0.0304		
overall	0.0040			0.2827			0.0421		

* Significant at 10% level; ** Significant at 5% level.

Table A1.23. Wage Performance of Semi-Skilled Workers in Large Manufacturing Firms

Dependent variable: log(wages for semi-skilled workers)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-2.2117	**	-32.023	0.0087	**	3.105	-0.0741	**	-6.053
Employees: Highly skilled	-0.2247		-1.340	0.0002		0.085	-0.0134		-1.480
Semi-skilled	0.1459	**	5.411	0.0016	**	14.254	0.0019	**	4.509
Low skilled	0.0136		0.868	0.0003	**	2.904	0.0030	**	5.893
Maquila	0.2785		0.283	0.0049		0.043	-0.0312		-0.061
Technology adoption	0.4442		1.626	0.4974	**	6.044	1.5389	**	4.925
Constant	38.1168	**	31.355	5.6114	**	45.972	8.8774	**	15.551
Number of obs.	408			1,554			1,672		
R-sq: within	0.8967			0.3222			0.0963		
between	0.0104			0.4492			0.0284		
overall	0.0155			0.4290			0.0428		

* Significant at 10% level; ** Significant at 5% level.

Table A1.24. Wage Performance of Low Skilled Workers in Large Manufacturing Firms

Dependent variable: log(wages for low skilled workers)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.2318	**	-34.646	0.0049		1.375	-0.0809	**	-5.869
Employees: Highly skilled	-0.2194		-1.346	0.0036		1.085	-0.0222	**	-2.194
Semi-skilled	0.0325		0.994	0.0000		0.059	0.0015	**	2.448
Low skilled	0.0707	**	4.388	0.0022	**	13.583	0.0048	**	7.704
Maquila	-1.1808		-0.994	0.0876		0.590	0.1566		0.278
Technology adoption	0.0688		0.273	0.4242	**	3.910	1.6095	**	4.788
Constant	40.1928	**	38.168	4.8480	**	30.899	7.8986	**	12.351
Number of obs.	417			1,411			1,532		
R-sq: within	0.9085			0.2958			0.1240		
between	0.0018			0.5015			0.1068		
overall	0.0090			0.4555			0.0791		

* Significant at 10% level; ** Significant at 5% level.

Table A1.25. Productivity Performance of Large Manufacturing Firms

Dependent variable: log(productivity)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	0.6864		0.621	0.0100	**	2.225	0.0147	**	5.045
Employees: Highly skilled	0.5336		0.861	0.0033		0.874	0.0053	**	2.649
Semi-skilled	0.0895		0.378	0.0002		0.806	0.0000		-0.045
Low skilled	-0.1694		-0.401	0.0002		0.828	-0.0004	**	-3.319
Maquila	dropped			-0.2318		-1.126	-0.0467		-0.392
Technology adoption	-0.5443		-0.638	0.4122	**	3.124	0.2271	**	3.188
Capital assets	0.0069		0.223	9.6e-07	*	1.835	0.0000	**	6.767
Constant	-11.0303		-0.291	3.8258	**	18.679	3.7894	**	28.237
Number of obs.	14			1,031			1,498		
R-sq: within	0.9583			0.0838			0.1216		
between	0.4637			0.1333			0.0995		
overall	0.3386			0.1351			0.1364		

* Significant at 10% level; ** Significant at 5% level.

Table A1.26. Net Employment Performance of Large Manufacturing Firms

Dependent variable: log(net employment)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	0.0210		0.100	-0.0030		-0.211	-0.0116		-1.015
Employees: Highly skilled	0.0361		0.067	0.0152	*	1.764	0.0122	**	2.141
Semi-skilled	0.1342		1.205	0.0005		1.003	0.0002		0.591
Low skilled	0.1779		1.877	0.0003		0.391	0.0003		0.641
Maquila	dropped			0.3862		0.881	-0.6237		-1.575
Technology adoption	0.0238		0.023	0.2741		0.889	-0.4370		-1.459
Constant	-2.2565		-0.658	2.4349	**	4.351	3.5170	**	6.645
Number of obs.	53			647			645		
R-sq: within	0.8803			0.0741			0.0783		
between	0.1151			0.0437			0.0084		
overall	0.1402			0.0487			0.0229		

* Significant at 10% level; ** Significant at 5% level.

Table A1.27. Wage Performance of Manufacturing Firms in the North Region

Dependent variable: log(total wages)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	-2.1823	**	-116.448	0.0086	**	2.165	-0.1282	**	-5.388
Employees: Highly skilled	-0.0041		-1.152	0.0124	**	3.536	-0.0080		-0.559
Semi-skilled	0.0007	**	4.172	0.0019	**	9.730	0.0013		1.337
Low skilled	0.0005	**	3.868	0.0008	**	4.823	0.0022	**	2.131
Maquila	-0.0744		-0.297	-0.0636		-0.493	-0.2001		-0.307
Technology adoption	0.2580	**	2.938	0.5831	**	6.038	0.6985		1.567
Constant	57.7898	**	127.590	5.5342	**	40.187	11.8802	**	12.658
Number of obs.	1,733			800			630		
R-sq: within	0.9467			0.3195			0.0819		
Between	0.0110			0.6364			0.0007		
Overall	0.0007			0.5662			0.0082		

* Significant at 10% level; ** Significant at 5% level.

Table A1.28. Productivity Performance of Manufacturing Firms in the North Region

Dependent variable: log(productivity)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	0.0695	**	4.691	0.0060		0.759	0.0118	**	2.280
Employees: Highly skilled	-0.0022		-0.496	-0.0018		-0.345	-0.0005		-0.147
Semi-skilled	-0.0005	**	-2.597	0.0003		0.599	0.0000		-0.046
Low skilled	-0.0003	**	-2.562	0.0002		0.365	-0.0005	**	-2.240
Maquila	-0.0822		-0.458	-0.1802		-0.656	-0.1089		-0.710
Technology adoption	-0.0368		-0.535	0.7089	**	3.958	0.4051	**	3.891
Capital assets	0.0000		0.511	2.1e-06	**	2.267	2.4e-06	**	5.659
Constant	2.1514	**	4.598	3.6255	**	11.915	3.7589	**	17.786
Number of obs.	740			454			550		
R-sq: within	0.1280			0.2178			0.1700		
Between	0.0000			0.1035			0.2205		
Overall	0.0002			0.1306			0.1841		

* Significant at 10% level; ** Significant at 5% level.

Table A1.29. Net Employment Performance of Manufacturing Firms in the North Region

Dependent variable: log(net employment)	1992-1995 Coeff.		1992-1995 t-Stat.	1995-1999 Coeff.		1995-1999 t-Stat.	1992-1999 Coeff.		1992-1999 t-Stat.
Firm Characteristics									
Age	0.0777		1.106	-0.0147		-0.543	0.0033		0.144
Employees: Highly skilled	-0.0087		-1.389	0.0853	**	2.095	0.0131		1.215
Semi-skilled	0.0014		1.404	0.0011		0.923	0.0002		0.327
Low skilled	0.0014	**	3.282	0.0010		1.006	0.0011		1.290
Maquila	1.4577		0.828	0.6246		1.201	0.6038		1.158
Technology adoption	0.5536		1.636	0.0501		0.109	-0.0097		-0.023
Constant	-0.5939		-0.357	1.9476	**	2.134	2.0121	**	2.372
Number of obs.	521			318			211		
R-sq: within	0.1967			0.2368			0.0893		
between	0.2021			0.0697			0.1108		
overall	0.2014			0.0766			0.1251		

* Significant at 10% level; ** Significant at 5% level.

Table A1.30. Wage Performance of Manufacturing Firms in the Central Region

Dependent variable: log(total wages)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-1.7333	**	-58.310	0.0169	**	6.179	-0.1269	**	-8.762
Employees: Highly skilled	0.0126	*	1.801	0.0017		1.032	-0.0351	**	-2.446
Semi-skilled	0.0028	**	5.976	0.0022	**	13.508	0.0026	**	3.517
Low skilled	0.0027	**	5.906	0.0022	**	12.070	0.0042	**	6.105
Maquila	0.0003		0.001	-0.0290		-0.337	0.0076		0.017
Technology adoption	1.1191	**	7.611	0.5582	**	10.105	1.3955	**	5.212
Constant	52.3282	**	63.035	5.1170	**	55.399	10.4436	**	20.247
Number of obs.	2,884			1,510			1,612		
R-sq: within	0.7655			0.3794			0.1230		
Between	0.0667			0.5754			0.1065		
overall	0.0009			0.5222			0.0565		

* Significant at 10% level; ** Significant at 5% level.

Table A1.31. Productivity Performance of Manufacturing Firms in the Central Region

Dependent variable: log(productivity)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	0.1274	**	16.716	0.0127	**	2.269	0.0230	**	6.204
Employees: Highly skilled	0.0011		0.803	0.0035		0.409	0.0124	**	3.390
Semi-skilled	-0.0004	**	-3.944	0.0004		1.127	-0.0001		-0.431
Low skilled	-0.0004	**	-4.591	0.0004		0.879	-0.0006	**	-3.161
Maquila	0.1187		1.285	-0.3592	**	-1.973	-0.2428	**	-1.987
Technology adoption	0.0947	**	2.769	0.4634	**	4.072	0.2552	**	3.610
Capital assets	0.0000		-0.956	0.0000		-0.745	1.2e-06	**	2.863
Constant	0.4943	**	2.147	3.7676	**	19.398	3.5785	**	26.728
Number of obs.	1,981			951			1,353		
R-sq: within	0.2862			0.0796			0.0892		
Between	0.0075			0.0871			0.0616		
overall	0.0099			0.0776			0.0692		

* Significant at 10% level; ** Significant at 5% level.

Table A1.32. Net Employment Performance of Manufacturing Firms in the Central Region

Dependent variable: log(net employment)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-0.0545		-0.792	-0.0010		-0.062	-0.0023		-0.169
Employees: Highly skilled	0.0328		1.259	0.0257		1.314	0.0087		1.045
Semi-skilled	0.0011		0.672	0.0020	**	2.776	0.0003		0.452
Low skilled	0.0019	*	1.948	0.0023	**	2.194	0.0009		1.494
Maquila	-2.2254	**	-2.763	0.2977		0.758	-0.4759		-1.400
Technology adoption	-0.0467		-0.153	0.3821		1.503	0.1822		0.799
Constant	3.6011	*	1.814	1.2197	**	2.556	2.1821	**	4.741
Number of obs.	717			594			594		
R-sq: within	0.1561			0.1382			0.1382		
Between	0.0398			0.1335			0.1335		
overall	0.0436			0.1429			0.1429		

* Significant at 10% level; ** Significant at 5% level.

Table A1.33. Wage Performance of Manufacturing Firms in the South Region

Dependent variable: log(total wages)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-1.2012	**	-15.913	0.0203	**	2.507	-0.0773	**	-2.254
Employees: Highly skilled	0.0256		0.904	0.0116		0.783	0.0144		0.199
Semi-skilled	0.0036	**	2.089	0.0017	**	3.281	0.0003		0.102
Low skilled	0.0084	**	4.103	0.0015	**	3.579	0.0040		1.327
Maquila	-1.9240		-1.324	0.5831	**	2.402	-0.7356		-0.377
Technology adoption	2.1293	**	4.602	0.4658	**	2.596	1.5689		1.598
Constant	38.8099	**	17.518	4.9897	**	16.494	9.6685	**	5.893
Number of obs.	391			218			151		
R-sq: within	0.6829			0.3296			0.1005		
Between	0.0708			0.4689			0.0125		
overall	0.0056			0.4395			0.0142		

* Significant at 10% level; ** Significant at 5% level.

Table A1.34. Productivity Performance of Manufacturing Firms in the South Region

Dependent variable: log(productivity)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	0.0599	**	2.011	0.0178	*	1.858	0.0210	**	3.265
Employees: Highly skilled	0.0009		0.123	-0.0157		-0.741	-0.0172		-1.327
Semi-skilled	-0.0007	*	-1.718	-0.0010		-1.079	-0.0015	**	-2.684
Low skilled	-0.0016	**	-2.682	0.0001		0.102	-0.0004		-0.619
Maquila	-0.1024		-0.247	0.2675		0.423	0.3057		0.799
Technology adoption	0.0017		0.011	0.4959		1.553	0.1573		0.835
Capital assets	0.0000		0.182	2.0e-05	**	2.220	2.2e-05	**	4.681
Constant	2.4305	**	2.344	3.2620	**	6.591	3.5023	**	10.629
Number of obs.	222			112			118		
R-sq: within	0.1771			0.3938			0.4045		
Between	0.0012			0.0898			0.0146		
Overall	0.0027			0.1260			0.0918		

* Significant at 10% level; ** Significant at 5% level.

Table A1.35. Net Employment Performance of Manufacturing Firms in the South Region

Dependent variable: log(net employment)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	0.0131		0.068	-0.0996		-0.782	-0.0709		-1.416
Employees: Highly skilled	0.1076		1.038	-0.0655		-0.245	0.0764		0.917
Semi-skilled	0.0029		0.337	-0.0010		-0.351	0.0010		0.445
Low skilled	0.0074		1.684	0.0002		0.025	0.0062		1.445
Maquila	-1.0224		-0.731	2.5018		0.813	1.4192		0.818
Technology adoption	-1.6972		-1.509	-0.2310		-0.193	-1.2882		-1.418
Constant	0.7254		0.136	5.5111	**	2.622	3.8439	*	2.115
Number of obs.	78			81			53		
R-sq: within	0.7152			0.4436			0.5148		
between	0.1544			0.0102			0.1389		
overall	0.1469			0.0078			0.1866		

* Significant at 10% level; ** Significant at 5% level.

Table A1.36. Wage Performance of Manufacturing Firms in Mexico City

Dependent variable: log(total wages)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-2.2507	**	-104.274	0.0035		1.157	-0.1019	**	-5.665
Employees: Highly skilled	0.0148	**	2.267	0.0106	**	3.126	-0.0175		-1.091
Semi-skilled	0.0004	**	2.190	0.0013	**	8.206	0.0014	**	2.124
Low skilled	0.0006	*	1.818	0.0010	**	4.865	0.0023	**	2.447
Maquila	0.1028		0.381	-0.0928		-0.686	-1.1305		-1.621
Technology adoption	0.3618	**	3.882	0.6487	**	7.693	1.5586	**	4.089
Constant	76.7338	**	111.880	5.6920	**	45.075	11.0466	**	14.089
Number of obs.	1,417			860			748		
R-sq: within	0.9509			0.2884			0.1103		
between	0.2344			0.5283			0.0011		
overall	0.0212			0.4698			0.0236		

* Significant at 10% level; ** Significant at 5% level.

Table A1.37. Productivity Performance of Manufacturing Firms in Mexico City

Dependent variable: log(productivity)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	0.1126	**	8.402	0.0072		1.396	0.0095	**	2.189
Employees: Highly skilled	0.0008		0.231	-0.0021		-0.474	0.0031		0.843
Semi-skilled	-0.0002	*	-1.756	0.0002		0.751	0.0001		0.906
Low skilled	-0.0002		-1.446	0.0008	**	2.172	0.0000		-0.229
Maquila	0.1331		0.847	0.1816		0.806	0.2152		1.231
Technology adoption	0.0375		0.678	0.4866	**	3.718	0.0923		1.011
Capital assets	3.3e-06		0.881	3.3e-06	**	3.152	5.5e-06	**	5.443
Constant	0.0745		0.159	3.6537	**	17.183	3.6820	**	19.604
Number of obs.	951			578			652		
R-sq: within	0.1915			0.1507			0.0980		
Between	0.0504			0.1470			0.2049		
overall	0.0476			0.1527			0.1446		

* Significant at 10% level; ** Significant at 5% level.

Table A1.38. Net Employment Performance of Manufacturing Firms in Mexico City

Dependent variable: log(net employment)	1992-1995 Coeff.		t-Stat.	1995-1999 Coeff.		t-Stat.	1992-1999 Coeff.		t-Stat.
Firm Characteristics									
Age	-0.0475		-0.667	0.0003		0.025	0.0044		0.352
Employees: Highly skilled	0.0143		0.426	0.0128		1.326	0.0088		0.909
Semi-skilled	0.0005		0.382	0.0020	*	2.002	0.0009		1.643
Low skilled	0.0043	**	2.799	-0.0009		-0.826	0.0003		0.493
Maquila	-0.9553		-0.667	-0.5789		-1.037	0.4879		1.100
Technology adoption	0.5631	*	1.824	-0.2403		-0.693	0.1190		0.388
Constant	2.7202		1.192	2.3452	**	3.814	1.7872	**	3.148
Number of obs.	364			320			271		
R-sq: within	0.2809			0.1411			0.0884		
between	0.0082			0.0477			0.0394		
overall	0.0146			0.0564			0.0394		

* Significant at 10% level; ** Significant at 5% level.

Annex 2: Wage Inequality

Table A2.1. Wage Inequality

Dependent variable: Log(highly skilled/unskilled wages)	1992-1995 Coeff.		Z-St.	1995-1999 Coeff.		Z-St.	1992-1999 Coeff.		Z-St.
Firm characteristics									
Size: Small	2.6615		1.595	-1.3684	*	-1.718	-1.1810		-1.386
Medium	0.7362		0.537	-1.4635	*	-1.826	-1.3873		-1.625
Large	Dropped			-1.5938	**	-1.984	-1.4417	*	-1.689
Age	0.0313	**	2.742	0.0045		1.464	-0.0019		-0.593
Employees: Highly skilled	0.0361	**	12.726	0.0206	**	8.614	0.0416	**	14.628
Semi-skilled	0.0010	**	5.211	0.0016	**	7.168	0.0005	**	2.581
Low skilled	-0.0022	**	-14.093	-0.0023	**	-11.471	-0.0027	**	-15.89
Maquila	-0.1107		-0.705	-0.0382		-0.354	0.1591		1.498
Technology adoption	0.0275		0.518	0.1128		1.529	0.0534		0.819
Constant	-2.7354	**	-3.260	0.5792		0.724	0.7860		0.922
Number of obs.	4,744			2,616			2,564		
R-sq: Within	0.1785			0.2274			0.2480		
Between	0.0905			0.2676			0.3063		
Overall	0.0870			0.2604			0.2952		

* Significant at 10% level; **Significant at 5% level.

APPENDIX A

INEGI has compiled the National Survey of Employment, Salaries, Technology, and Training (ENESTYC). The Ministry of Labor co-designed the questionnaire, which gathered rich information on training, technology, wages, employment, forms of labor contracting, and internal plant organization of Mexican manufacturing firms. The government conducted the survey in 1992, 1995, and 1999, but its questions on technology ask whether the firm adopted technology in the periods 1989-1992, 1994-1995, or 1997-1999, respectively. Our references to the time of technology adoption mention only the final year of the period (e.g. 1992 rather than 1989-1992). Data from the 1992 survey includes 5,071 firms, from the 1995 survey includes 5,242 firms, and from the 1999 survey includes 7,429 firms.

A valuable feature of ENESTYC is that it allows us to identify the same firm in 1992, 1995, and 1999. Nonetheless, we should qualify our estimations with survivor bias. Only firms that exist in all three years can be included in the panel database. As Audretsch (1995) shows, survival likelihood is strikingly low for small and new enterprises and increases with firm size and age. Thus, the panel includes an unrepresentatively high number of large and mature firms. While random observation selection should not cause bias in our resulting estimations, surviving firms are not randomly selected. Darwinian selection of extant firms means that the firms in our sample tend to be more efficient and have better performance than an average Mexican firm.

Another advantage of this database is the broad spectrum of firm sizes included by industry, shown in tables B.1-B.3. The rich information available in ENESTYC allows us to distinguish technology diffusion policies for firms of different size and character.

INEGI also conducts the Annual Industrial Survey (EIA). The survey covers 6,500 manufacturing plants throughout Mexico that account for 80 percent of production in each industry group. Since the survey attempts to cover the majority of manufacturing production but not a majority of plants in all categories, our sample includes all large plants and most medium-sized scale plants, but few small-scale plants and very few microenterpise plants.

We link the ENESTYC panels to firms in the EIA. This allows us to combine EIA data on productivity, labor, value-added, and capital with ENESTYC variables for the plants common to both surveys. The panels also include some regional variables using the Indicators of Scientific and Technology Activity in Mexico from the National Council of Science and Technology (CONACYT). A description of the variables in the panels appears in the Appendix. The 1992-95 panel has 3,293 firms, the 1995-99 panel has 1,717 firms, and the 1992-99 panel has 1,066 firms.

The information on individual establishments that INEGI gathers through its questionnaires (which law requires firms to answer) is legally confidential, and INEGI is unable to give the raw data to outside agencies. Therefore, we followed an established procedure in which most data analysis was done in INEGI's Aguascalientes headquarters with the support of INEGI personnel. Nevertheless, the reader should bear in mind the limitations on data analysis imposed by this institutional arrangement.

APPENDIX B

Table B.1. Manufacturing Firms in the 1992-1995 Panel by Industry and Size

Division	All	Size			
		Large	Medium	Small	Micro
Total	**3,293**	**352**	**576**	**1,099**	**1,266**
Food, beverage and tobacco	669	105	114	163	287
Textiles, clothing, leather	551	36	93	231	191
Wood and wood products	149	28	42	61	18
Paper and paper products	219	16	31	103	69
Chemical products	494	40	94	185	175
Non-metallic minerals	161	45	31	25	60
Basic metal industries	102	13	13	39	37
Metal products, machinery	897	65	147	272	413
Other manufacturing industries	51	4	11	20	16

Source: 1992-95 ENESTYC Panel.

Table B.2. Manufacturing Firms in the 1995-1999 Panel by Industry and Size

Division	All	Size			
		Large	Medium	Small	Micro
Total	**1,717**	**829**	**737**	**145**	**6**
Food, beverage and tobacco	372	232	114	26	
Textiles, clothing, leather	273	133	113	23	4
Wood and wood products	57	19	32	6	
Paper and paper products	146	54	83	9	
Chemical products	306	126	153	26	1
Non-metallic minerals	75	32	33	10	
Basic metal industries	41	21	15	5	
Metal products, machinery	419	198	183	37	1
Other manufacturing industries	28	14	11	3	

Source: 1995-99 ENESTYC Panel.

Table B.3. Manufacturing Firms in the 1992-1999 Panel by Industry and Size

Division	All	Size			
		Large	Medium	Small	Micro
Total	1,066	554	439	72	1
Food, beverage and tobacco	227	154	63	10	
Textiles, clothing, leather	162	70	80	12	
Wood and wood products	36	9	19	8	
Paper and paper products	95	36	52	7	
Chemical products	190	86	87	16	1
Non-metallic minerals	46	34	10	2	
Basic metal industries	36	18	18		
Metal products, machinery	257	138	102	17	
Other manufacturing industries	17	9	8		

Source: 1992-99 ENESTYC Panel.

APPENDIX C

1992-99 Panel Variables Description

Variable	Description	Value
From the ENESTYC		
Firm size	Firm size according to the number of workers: Micro 1 - 15 Small 16 - 100 Medium 101 -250 Large 250 - more	Dummy for each size 1= if the firm belongs to a certain size 0= otherwise.
Division	Manufacturing industries: 1) Food, beverages, and tobacco 2) Textiles, clothing, and leather 3) Wood and wood products 4) Paper, paper products, printing, and publishing 5) Chemicals, oil derivatives, and coal 6) Non-metallic mineral products 7) Basic metallic industries 8) Metallic products, machinery, and equipment 9) Other manufacturing industries	Dummy for each industry 1= if the firm belongs to a certain industry 0= otherwise.
Total workers	Number of workers in the firm.	Continuous
Regions:		Dummies
North	Includes the states of Baja California, Baja California Sur, Coahuila, Chihuahua, Durango, Nuevo León, Sinaloa, Sonora, Tamaulipas, and Zacatecas.	1= if the firm is located in the North, 0= otherwise.
Center	Includes the states of: Aguascalientes, Colima, Guanajuato, Hidalgo, Jalisco, México, Michoacán, Morelos, Nayarit, Puebla, Querétaro, San Luis Potosí, and Tlaxcala.	1= if the firm is located in the Center, 0= otherwise.
South	Includes the states of Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz, and Yucatán.	1= if the firm is located in the South, 0= otherwise.
Capital	Distrito Federal	1= if the firm is located in the Capital, 0= otherwise.
Years	Firm's age.	Continuous
Technology adoption	Adoption of new technology.	Dummy 1= if the firm adopts new technology, 0= otherwise.
Highly skilled workers	Number of executives and managers in the firm.	Continuous
Semi-skilled workers	Number of production workers in the firm.	Continuous
Unskilled workers	Number of general workers in the firm.	Continuous
Share of highly skilled workers	Share of highly skilled workers from the total of workers in the firm.	Ranks between 0-100
Share of semi-skilled workers	Share of semi-skilled workers from the total of workers in the firm.	Ranks between 0-100
Share of unskilled workers	Share of unskilled workers from the total of workers in the firm.	Ranks between 0-100
New hires	New hires.	Continuous
Laidoffs	Dismissals.	Continuous
Net employment	New hires less dismissals.	Continuous
Total wages	Total wages in real pesos paid in the firm.	Continuous
Highly skilled wages	Total wages in real pesos paid to the highly skilled workers in the firm.	Continuous
Semi-skilled wages	Total wages in real pesos paid to the semi-skilled workers in the firm.	Continuous

Unskilled wages	Total wages in real pesos paid to the unskilled workers in the firm.	Continuous
Share of highly skilled wages	Share of the highly skilled workers wages from the firm's total wages.	Ranks between 0-100
Share of semi-skilled wages	Share of the semi-skilled workers wages from the firm's total wages.	Ranks between 0-100
Share of unskilled wages	Share of the unskilled workers wages from the firm's total wages.	Ranks between 0-100
Maquila	Firms dedicated to maquila activities.	Dummy 1= if maquila 0= otherwise.
Productivity	Firm's productivity measured as output per worker.	Continuous
From the EIA		
Capital assets	Firm's capital: fixed assets, not deflated.	Continuous

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